

Case Report

Partial trisomy 15: a rare occurrence

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ABSTRACT

Partial trisomy 15q is a very rare entity and most of them are characterized by duplication of regions 15q21-15q26.3. This duplication is frequently associated with deletions in another chromosome resulting in unbalanced translocations. Authors report here, a rare case of partial trisomy 15, with breakpoints between 15q11.1 to q23, probably the first reported case with these breakpoints. Irrespective of the breakpoints, the phenotypic features are consistent in all affected cases and predominantly consist of craniofacial anomalies. In addition, finger abnormalities, very short neck, skeletal malformations and congenital heart disease may be present. Our neonate had typical dysmorphic features of arachnocraniodactyly, narrow face, large prominent nose with broad nasal bridge, long philtrum, pointed chin, short neck, and low set deformed ears. Neonates' cytogenetic analysis revealed additional chromosomal material on the long arm of the chromosome 15 from q11.1 to q23.1, which was suggestive of partial trisomy of chromosome 15. Most cases reported have had a stormy clinical course, however, our proband had only mild respiratory distress at birth and she was discharged in a few days.

Keywords: Arachnocraniodactyly, Dysmorphic features, Partial duplication 15q, Trisomy chromosome 15q

INTRODUCTION

Partial trisomy 15 is an extremely rare chromosomal disorder, in which only a part of the long arm of the 15th chromosome is duplicated. It was initially described by Fujimoto and colleagues in 1974 and since then at least 50 cases with duplication of regions 15q21-15q26.3 have been identified and over the years breakpoints at various regions have been reported.¹ In addition, Zollino has described cases with trisomy 15q21-24qter.² De novo duplication of 15q24-q26.3 have been reported by Kim et al. in 2011.³ Despite the variations in the breakpoints in the chromosome, the clinical phenotypic features in all trisomy 15 syndromes are consistent.^{1,3} These are associated mainly with craniofacial malformations, arachnocraniodactyly and skeletal abnormalities. Rarely, few cases may present with extremely severe

manifestations such as abortions and stillbirth.² The cases described by Zollino with trisomy 15q21-24qter had renal anomalies along with craniosynostosis. Patients who had distal duplication from 15q25-26 to qter had overgrowth and tall stature as observed by Faivre et al.⁴ Authors are reporting a rare case of partial trisomy 15, with breakpoints between 15q11.1 to q23 with typical clinical features.

CASE REPORT

A full-term female neonate weighing 2.3kgs, second by birth order, was born of non-consanguineous marriage, vaginally to a 24-year-old mother with an uncomplicated antenatal course. Baby's parents were phenotypically normal, and mother had first a spontaneous abortion followed by an apparently normal healthy female child.

She had mild respiratory distress at birth that settled over a period of two days. General examination revealed dysmorphic features in the form of a narrow face, with down-slanting small palpebral fissures and a large, prominent, nose with broad nasal bridge, long philtrum, pointed chin, short neck, and low set deformed ears with no microcephaly. She had long tapering fingers and slender hands (arachnocamptodactyly) (Figure 1).



Figure 1: Clinical picture depicting the facial features of partial trisomy 15 namely long philtrum, short palpebral fissure and broad nasal bridge.

A detailed systemic examination was normal except cardiovascular examination revealed a murmur. Routine investigations were normal; however, on echocardiogram, patent ductus arteriosus and atrial septal defects were detected. Cranial ultrasound and computed tomography scan of the brain showed mild hydrocephalus with dilated lateral and third ventricle (Figure 2).

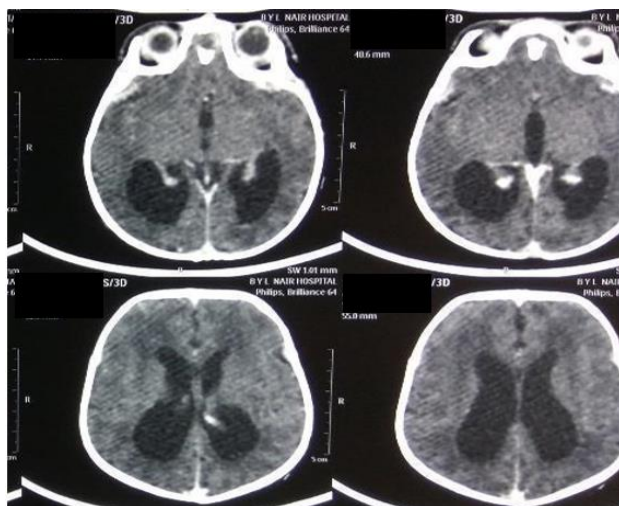


Figure 2: CT scan brain revealed dilated lateral ventricles.

Cytogenetic analysis of peripheral blood by leucocyte culture metaphase G banding revealed additional chromosomal material on the long arm of one

chromosome 15 from q11.1 to q23.1 and this clinched the diagnosis of partial trisomy of chromosome 15 (Figure 3).

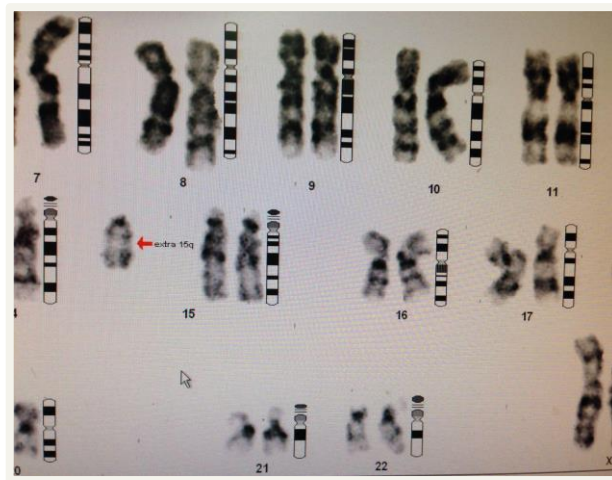


Figure 3: Cytogenetic analysis: karyotyping of the baby showing partial duplication of chromosome 15.

However, parents were not willing for genetic workup due to financial constraints and they did not wish to have further children.

DISCUSSION

Partial trisomy 15 represents a rare and heterogeneous group occurring from a wide spectrum of chromosomal aberrations. This can happen either from a balanced parental translocation, or as a result of parental mosaicism or de novo.^{5,6} Partial tetrasomy have been reported by Parker et al and by Crandall et al, due to an inverted duplication of the proximal part of the chromosome.⁷⁻¹⁰ Even, a de novo case has been reported with an extra autosome being identified as chromosome number 22.¹¹ Majority of the patients with partial trisomy 15, have breakpoints between regions 15q21 and 15q23.¹²⁻¹⁴ In those with distal trisomy 15q, the duplicated portion of 15q usually begins between bands 15q21 and 15q23 (breakpoint) and extends toward the end or “terminal” portion of chromosome 15q (qter). Rarely, there have been cases with breakpoints at 15q15 and 15q26.¹⁴ Our case had breakpoints between 15q11.1 to q23.1 and to our knowledge this is the first case being reported. Our neonates’ karyotype showed partial trisomy of chromosome 15 which is probably because of a balanced translocation in parents. The characteristic physical features and symptoms are seen due to duplication of the distal portion of chromosome 15q.¹⁵ However, depending upon the exact length and location of the duplicated portion of chromosome 15q, the range and severity of associated abnormalities may vary. The facial features are distinctive and include prominent nose with broad nasal bridge (96%), camptodactyly (100%), cardiac defects (69%), sloping forehead and down-slanting

palpebral fissures. Other clinical features include a short neck with or without vertebral anomalies, long, well-defined philtrum, and occasional genital abnormalities. Our case had most of the described above features. Two cases reported by Parker and Alfi et al, and Bucher et al, had shown no abnormal facies or congenital anomalies apart from strabismus.^{7,8} Similarly, Jennifer et al presented two cases with ptosis and one of them also had cleft vulva.¹⁶ Rarely, if the balanced parental translocations resulted in either partial monosomy or partial trisomy for different autosomes, a specific correlation between karyotype and phenotype is difficult to establish. This is because the involvement of another autosome may dominate the phenotypic features.^{5,9,11,17} Prognosis is guarded and survival beyond childhood is rare. However, survival till adulthood has been observed only in two patients and both these patients had a Marfan-like appearance as reported by Kristoffersson.¹⁸ In addition, Cox and Butler et al, reported a 36 year old male with distal partial trisomy 15q26 and partial monosomy 16p13.3.¹⁹ This case necessitates the need for detailed genetic analysis in all cases of facial dysmorphism and which would further guide in genetic counselling of parents.

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